

RESEARCH OUTPUTS / RÉSULTATS DE RECHERCHE

Capturing multiple social perspectives on adaptation across scales

Dujardin, S.; Orban-Ferauge, F.; Cañares, M. P.; Dendoncker, N.

Published in:
Climate and Development

DOI:
<http://dx.doi.org/10.1080/17565529.2017.1301863>

Publication date:
2018

Document Version
Version created as part of publication process; publisher's layout; not normally made publicly available

[Link to publication](#)

Citation for pulished version (HARVARD):
Dujardin, S, Orban-Ferauge, F, Cañares, MP & Dendoncker, N 2018, 'Capturing multiple social perspectives on adaptation across scales: a Q-method analysis of actors from development planning in the Philippines', *Climate and Development*, vol. 10, no. 5, pp. 458-470. <https://doi.org/10.1080/17565529.2017.1301863>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



Capturing multiple social perspectives on adaptation across scales: A Q-method analysis of actors from development planning in the Philippines

Journal:	<i>Climate and Development</i>
Manuscript ID	15-CDEV708-RA.R3
Manuscript Type:	Research Article
Keywords:	Adaptation, Development, Participation, Urban Development, Southeast Asia

SCHOLARONE™
Manuscripts

**Capturing multiple social perspectives on adaptation across scales:
A Q-method analysis of actors from development planning in the Philippines**

Abstract

This paper describes and analyses viewpoints regarding climate change adaptation held among key social actors from the field of development planning in the Philippines. Four empirically significant social perspectives are determined – institutional, grassroots, developmental and physical planning – using Q-method, an intensive qualitative and quantitative technique. Major differences and commonalities between perspectives are highlighted, in addition to actors’ arguments used to justify claims. Drawing upon an actor-oriented approach, results contribute filling a knowledge gap in the literature on the need to develop approaches that can guide adaptation thinking in development planning. While the four perspectives identified provide evidence that differentiated viewpoints on climate change and planning practices may lead to divergent adaptation strategies, commonalities among social perspectives suggest that shared adaptations may also emerge both among actors from multiple organizational structures and across the organisational hierarchy of planning. By building learning processes that include multiple social perspectives across scales, development planning can become a promising candidate for strengthening adaptive capacities and delivering more effective responses to climate change.

Key words: Climate change adaptation, development planning, social perspectives, Q-method, Philippines, Bohol.

1. Introduction

Concerns about the nature, pace and implications of climate change have been the subject of scientific debates for many years. Recently, the inclusion of a broad range of actors is frequently promoted in policy responses to climate change. References to 'participation', 'stakeholder engagement', 'bottom-up' processes, and other terms associated with a discourse of inclusive governance are widespread (Few, Brown, & Tompkins, 2007). In this regard, the Intergovernmental Panel on Climate Change (IPCC) claims with "high confidence" (Yohe et al., 2007, p.813) that participatory processes can reduce vulnerability to the hazards associated with current and future climate variability and extremes. Such a call for inclusive governance has been echoed within the fields of planning and development where inclusive practices are often promoted for fundamentally reinforcing key aspects of adaptation.

Understood as the link between knowledge and action (Friedmann, 1987), development planning can help foreseeing and guiding change by undertaking actions to reduce the risks and capitalize on the opportunities associated with global climate change (Füssel, 2007; Hall, 1982; Potter, 1985; Pugh & Potter, 2003). Interdisciplinary, multi-scale, stressing the physical, yet inescapably social, it can also support the inclusion of multiple actors within planning processes in order to incorporate a knowledge base tailored to local places within adaptation plans (Blanco et al., 2009). Besides, implementing multiple actor processes within planning mechanisms for initiating structural measures creates the potential for more effective risk reduction whilst building capacity, enhancing governance and accountability, and increasing ownership and more sustainable outcomes (Cutter et al., 2012).

Nonetheless, planning theories and development frameworks are often poorly articulated around the challenge of adaptation to climate change, highlighting the need to develop approaches that can guide adaptation thinking in development planning practice (Hedger, Moench, Dixit, Kaur, & Anderson, 2011). Meanwhile, experience in the field of adaptation research shows the increasing importance to recognise the complexities inherent in efforts to engage multiple actors for building adaptive capacity (Engle & Lemos, 2010; Huntjens et al., 2012; Inderberg, Eriksen, O'Brien, & Sygna, 2014). Consequently, this research investigates how to guide adaptation thinking in development planning by building upon a framework that encompasses two key components.

First, climate change is a challenge that cannot be addressed solely by a single level of individual or organisational actor. Although local community actors for instance are critical for action and essential elements for local adaptation, adaptive capacities are not created in a vacuum. Local-level institutions often provide the enabling environment for adaptation planning and implementation (Cutter et al., 2012). Adaptation thus requires 'multi-level' or 'multiscale' governance (Bulkeley & Betsill, 2005; Leck & Simon, 2013), which involves organisations and institutions from both the government and non-government sectors. Likewise, responding to the novel hazards of climate change requires social learning systems enable to take decisions at an appropriate level in the organisational hierarchy (Cash & Moser, 2000).

Second, building successful adaptations requires the capacity to combine various social perspectives. As Pelling (2011) pointed, it is clear that multiple actors will have viewpoints on what to protect, enhance or expend through adaptive actions and these may not be easily

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

resolved. Hence, capturing various perspectives of multiple actors holding different viewpoints is pivotal in mutually achieving short-term and long-term adaptation needs to climate change (Bardsley & Sweeney, 2010; Corfee-Morlot, Cochran, Hallegatte, & Teasdale, 2011; K. O'Brien & Selboe, 2015; Shaw et al., 2009). As O'Brien (2009) argues, the challenge is to identify adaptation strategies that acknowledge and address a spectrum of values and viewpoints. In contrast to systems that can be objectively measured and observed, these "subjectively influence the adaptations that are considered desirable and thus prioritised" (O'Brien, K., 2009, p.164).

Building upon this framework, this paper investigates the potential role of development planning for strengthening adaptive capacities. In particular, it explores how development planning can create learning processes that incorporate various social perspectives and facilitate developing a common understanding critical for multiscale and multiple actors' actions. An actor-oriented approach focusing on state and non-state actors is undertaken by accounting for government and civil society organisations (CSOs) involved in both planned and autonomous adaptation strategies¹. Such an approach recognizes multiple simultaneous adaptations, but also betrays a critical issue, i.e. the potential mismatch between adaptation efforts of planned and autonomous activities. This kind of interaction has been recognised between two types of actors, such as when community adaptations are undermined by local government actions (Adger, Arnell, & Tompkins, 2005; Bulkeley & Betsill, 2005). Yet, poor evidence exists as to how actors engaged in those two forms of adaptation strategies may hold conflicting viewpoints on adaptation (Engle & Lemos, 2010; Hedger et al., 2011; Huntjens et al., 2012).

The aim of this study is thus two-fold: (i) to capture multiple social perspectives on climate change adaptation and planning practices across the organisational hierarchy of planning, and (ii) to examine whether commonalities and differences among these perspectives may lead towards divergent or convergent adaptation strategies. Within the next sections, we first introduce the adaptation and development planning context of our case study, the Philippines. Then, we implement the Q-method, an intensive qualitative and quantitative technique for examining and characterizing multiple actors' viewpoints. Lastly, we detail four social perspectives and further discuss their commonalities and differences.

2. Study area

Climate change poses a unique set of challenges to archipelagic countries such as the Philippines. Due to its geography, the country is one of the top most disaster prone countries in the world facing climate-induced hazards such as tropical cyclones, droughts, landslides, and floods (Birkmann et al., 2011). Yet, climate change is exacerbating these hazards, which are likely to increase as climate projections foresee an increase in the frequency and severity of those events (Van Aalst, 2006). Global warming and sea level rise also potentially affect settlement patterns, agricultural systems, fishing practices and other livelihood pursuits in various ways (Capili, Ibay, & Villarin, 2005; Rincón & Virtucio, 2008). In this context, the Philippines needs to address climate-related risks because of its exposure and relative vulnerability, but also because it needs to further develop its adaptive capacity (AKP, 2012). The country's existing

¹ Planned adaptation is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state. By contrast, autonomous adaptation is a response to experienced climate and its effects, without planning explicitly or consciously focused on addressing climate change (Agard et al., 2014).

adaptive capacity is drawn upon pre-existent disaster risk reduction and management (DRRM) activities, but has now to be enhanced where possible, avoiding to start from scratch and duplicating current initiatives (IDS, 2010).

This study focuses on the island province of Bohol in the central Visayas region (see Figure 1). Referred in the country as being at the forefront of local governance (Cañares, 2014), the province of Bohol has a great potential for building adaptation strategies resulting from the interactions between different levels of social actors and institutions. There are numerous climate change adaptation strategies undertaken by various types of actors depending on their focus areas (see IDS, 2010). Among the most active in the field of development planning are government agencies and civil society organisations.

On the government side, Local Government Units (LGUs)² in Bohol are mainly involved in planned adaptation strategies through current efforts of mainstreaming climate change adaption into development planning at all levels of governance, as required by the Climate Change Act. Being a pilot province for the project named “Integrating Disaster Risk Reduction and Climate Change Adaptation in Local Planning and Decision-making Processes”, LGUs from Bohol are additionally solicited to address the challenge of climate change in local development planning. By law, *barangays* (i.e. the smallest political administrative division) should identify issues, best practices and implement solutions, while the municipal and city governments are mandated to consider adaptation as one of their regular functions. The provincial governments in turn shall provide technical assistance, enforcement, and information management support to municipalities and cities (AKP, 2012).

CSOs in Bohol, on the other side, are mostly involved in autonomous adaptation by developing strategies not explicitly related to climate change, but aimed at reducing vulnerability and enhancing overall adaptive capacity of individuals and communities in areas of high climate impacts. In this regard, the most active NGOs on the island are committed to address pressing socio-economic and environmental issues by strengthening and capacitating local communities and development organisations such as People's Organizations (PO) and cooperatives (e.g. farmers, fishers, and women). These kind of autonomous actions can improve the overall adaptive capacity of households without necessarily targeting a particular climatic stressor or addressing a climate extreme event.

However, an integrated strategy linking the national, planned and local, autonomous development practices still has to be built both within and in-between civil society forces and the government at various levels. Resurreccion et al. (2008) for instance pointed a mismatch between national level discussions with broad-scale scoping, and local level realities in adaptation where macro scale analysis of climate change are unresponsive to local needs and realities for adaptation. Within the next section, such a disjunction between planned and autonomous forms of adaptation is addressed by comparing actors' viewpoints from the field of development planning in the Philippines.

Fig. 1. Study area and survey sites

² A LGU in the Filipino context may be a province, a city, a municipality, or a *barangay* in the descending order of geographical scale and scope of political power. In geographical terms, each LGU has its own territorial jurisdiction but the smaller unit is embedded in the next higher unit forming a nested pattern (DILG, 2008).

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

133

134 **3. Method and data**

135

136 This study relies on Q-method (Brown, 1980; Stephenson, 1935) to understand and describe the

137 variety of subjective viewpoints regarding climate change adaptation held among actors from

138 government agencies and civil society organisations in the Philippines. Used as “a powerful tool

139 for anti-essentialist approaches to subjectivity and for constructivist inquiries” (Robbins &

140 Krueger, 2000, p.636), it provides a methodological framework for a systematic, multi-scalar

141 examination of social perspectives across the scales of the organisational hierarchy of planning.

142 Most typically in Q, a person is presented with a set of subjective statements about some topic,

143 and is asked to rank-order them. Based upon this sorting exercise called ‘Q-sort’, factor analysis

144 is processed to identify patterns in individuals’ Q-sorts. What factor analysis does is to

145 mathematically create a few new variables that explain variation in many variables. In a Q-

146 method survey the variables are the Q-sorts where the factor analysis attempts to bring the

147 complexity of multiple individuals’ Q-sorts down to a simpler picture. Once the factor is described

148 in the language of the Q statements, it becomes the product of the Q-method survey. The

149 individuals’ Q-sorts are individual viewpoints, but the factor analysis solutions reflect “deeper

150 organizing principles” (Stephenson 1965) called social perspectives for the purpose of this paper.

151

152 The Q-method was implemented according to four main steps. First, a concourse of 40

153 statements was elaborated. The concourse builds upon our main research question by

154 translating subjective ways of perceiving climate change and strengthening adaptive capacities. It

155 aims at bringing controversial viewpoints to the fore on climate change adaptation and planning

156 practices in the Philippines. Statements are a matter of opinion and drew upon the scientific

157 literature, key reports and documents (e.g. the 1st Bohol Climate Change Summit 2010), and

158 interviews with key informants (i.e. experts from the academia and research institutes, provincial

159 and municipal government officers from planning, environment and governance offices, and

160 active leaders of local NGOs). Three main areas of enquiry were identified: climate change

161 perception, adaptation approach, and planning practices (see Table 3). As statements were

162 submitted to respondents with a wide range of backgrounds, these were translated in Visayan for

163 increasing readability with respondents feeling less comfortable with English.

164

165 During the second step, respondents were identified using purposive, non-random sampling to

166 sort the statements on a scale from -3 to +3 according to their degree of (dis)agreement. When

167 sorting statements, the internal frame of reference of each respondent is embedded in their

168 responses. The Q-method thus fully engages with the respondent's own logic and their personal

169 experiences. Q methodologically does not ascribe any *a priori* meaning to the statements in

170 question. Meanings are created during the process of responses, which contrasts with R

171 methods in which both variables and tests in question are constructed by the researcher's frame

172 of reference (McKeown & Thomas, 1988).

173

174 The methodology was implemented with a purposeful sample of 37 respondents from

175 government agencies and civil society organisations during August and September 2013 (Table

176 1). Main respondents surveyed were from both the fields of planning and development in the

177 province of Bohol. Complementarily, associated respondents from higher levels of the planning

178 hierarchy were considered at the regional and national levels for their involvement in

mainstreaming climate change adaptation into local development planning. Q-sorts were administered under the condition of an unconstrained sort, i.e. no particular statistical distribution was forced on the rating of statements (Barry & Proops, 1999; McKeown & Thomas, 1988). During the sorting exercise, subsidiary open questions were asked in order to discuss respondents' choices. Q-sorts lasted 43 minutes on average.

Table 1.

The third step involved the sequential application of three sets of statistical procedures, i.e.: correlation, factor or principal component (PCA) analysis, and the computation of factor scores (see Robbins, 2005; Zabala, 2014). Following the Q-method, a PCA analysis was carried out on a data matrix with the 37 Q-sorts as variables (columns) and all statements as sample elements (rows) with the aim to group respondents on the basis of the degree of commonality of their viewpoints on statements. Then, factors were extracted by retaining those with both theoretical and statistical significance in order to perform the Q-method reflexively with "full awareness of its interpretive dimensions and not as a number-crunching exercise" (Eden, Donaldson, & Walker, 2005, p.421). To achieve this, Brown (1980's) criteria which retains factors containing at least two loadings in excess of the 0,01 or 0,05 level of significance was used. Besides, a Promax rotation (see Abdi, 2003) was performed on the Q matrix in order to facilitate data interpretability

Fourth, factors were interpreted as social perspectives by selecting defining Q-sorts or "like-minded individuals" (Pini, Previte, & Haslam-McKenzie, 2007, p.8) loading significantly on the same factor³.

Factors are "attitudes of mind" (Stephenson, 1965, p.281) held in common by several respondents. In order to inform their interpretation, coded interview transcripts were essential in eliciting the rationale of respondents' viewpoint. In total, 27h27 minutes of audio records were transcribed and an average number of 32 comments per statement were extracted for interpretation.

Implementing the Q-method is of particular interest for capturing actors' viewpoints on climate change adaptation as it allows going beyond methodological individualism, i.e. the view that social events must be explained by reducing them to individual actions, and accounting for the post-structuralist assumption that meaning and action in development planning are made of systemic relations between individuals and underlying structures (Murdoch, 2006). The power of the Q-method lies in the determination of social perspectives reflecting a totality or *gestalt* that is greater than the sum of the part. As Brown (1980, p.14) explains, one of the core features of the Q factor analysis is that "it is more gestaltist and wholistic, rather than analytic and atomistic, and reflects functional relatedness", meaning that individual's viewpoint is captured in accordance with its relation to the whole context of which it is a part. In other words, the method overcomes the distinction between apparent forms of reality from respondents' speech and essential underlying, constitutive structures and relations between these and their organizations for instance. In the next section, we detail the results obtained after implementing this four-step analysis.

³ 'Defining sorts' were identified in this study according to two conditions: (i) the 5% level of significance, and (ii) the condition that the factor explains more than half of the common variance.

4. Results

Four social perspectives could be extracted from the dataset drawing upon experience in the field, a careful statistical examination of data, and interview transcripts. The PCA yielded four factors accounting respectively for 18,5%, 14,0%, 13,6%, 8,2% of the explained variance. In total, 8 out of 37 participants have significant loadings on factor 1, 8 on factor 2, 9 on factor 3 and 3 on factor 4 (see Table 2). Factors are all positively correlated suggesting a convergence of respondent's viewpoints on the concourse of statements. As a result, the four factors extracted represent social perspectives that are divergent but not opposite to each other. Two factors, F1 and F3, have the strongest correlation (0,798), while F2 and F4 are the most weakly correlated (0,331). In Q-method, this further suggests that respondents defining F1 and F3 share closer viewpoints, while F2 and F4 tend to present more differentiated ones.

Table 2 presents the factors in which the entries in the table are called factor loadings. The latter represent the extent to which a respondent is associated with a particular factor. As Table 2 shows, the highest significant factor loading of F1 (0,876) belongs to a Provincial planning and development officer (Q01) and thus contributes the most to characterize the first social perspective associated with F1, named "the institutional perspective". Most defining sorts on this factor are provincial, regional and national officers from government agencies. Their structural position within the organisational hierarchy of planning allows providing plausible explanations for attitudes of mind held in common. However, not all government officers load highest on F1, and two Q-sorts from NGO representatives loaded significantly on this factor (Q06 and Q08).

Table 2

Table 3 presents per factor the weighted scores for each statement. These scores are calculated and normalized as factor scores (abbreviated 'z-scores'). They are subsequently converted into rank statement scores for ease of interpretation, i.e. factor scores are expressed in terms of the original Q frequency distribution of (-3, -2, -1, 0, 1, 2, 3). The array of factor scores show the best model for the perspective and represent a summary of "significantly different assemblages of claims" (Robbins & Krueger, 2000, p.639). Likewise, each perspective represents a coherent pattern of opinion about climate change, adaptation, and planning practices in the Philippines. Within the next sections, the four social perspectives identified are empirically determined by describing the factor in the language of the Q-statements and the arguments used by respondents to justify their claims.

Table 3

4.1. The institutional perspective

F1 represents an institutional perspective that supports planned adaptation by highly valuing a strong role of government institutions, including through the mainstreaming climate change adaptation into local development planning.

Several significantly different statements characterize the institutional perspective, the most prominent of which pertains to the role of governments compared to NGOs for building adaptive capacity. A legitimization of government's role is expressed in the negative ranking of statement

20 (see S20 in Table 3, $z=-1,07$). In this perspective, NGOs are seen as lacking resources for initiating and sustaining capacity building initiatives. When considering the elaboration of climate change adaptation plans, a climate change officer (see Q02 in Table 2, $F1=0,844$) for instance explains that NGOs need the technical expertise from governments which are the “data producer” of climate change knowledge.

Besides, such a pro-government perspective is supported by the idea that governments can better implement and sustain lasting changes over society than NGOs. This is supported by several assertions arguing that governments are the regulatory bodies with authority on people over the long run because “governments have the power” (Q01) and “make people abide with the laws” (Q03).

The institutional perspective is then further expressed in the negative ranking of statement 2 which claims that one cannot go against nature. Respondents who load highly on F1 strongly believe something can be done about climate change in such a way that “once you are prepared you are less likely to be affected” (Q07). In this regard, it emphasizes the potential role of mitigation measures to lessen the negative impacts of disasters. In particular, the institutional perspective advocates for a greater mainstreaming of climate change adaptation at the local level through the involvement of both LGUs and individuals, as well as more pro-activity in order to minimize hazard damages (S19, S23, S27).

Furthermore, the institutional perspective distinctively rejects the idea that climate change is only a threat (S12). Contrary to all three other factors, this perspective considers that benefits exist. One provincial environment officer (Q07) exemplifies the negative score given to this claim telling that climate change is positive for agriculture in the Bohol province, especially rice crops production. Increasing rainfalls may offer the opportunity for farmers to plant four times a year instead of two traditionally, which becomes particularly true for rain fed paddies. In addition, F1 loaders consider that climate change can also induce a change in perceptions and attitudes regarding the environment. Taking the example of plastics segregation (instead of dumping or burning), an environmental NGO representative (Q08) further explains that climate change is changing how people do things, their perspectives, attitudes and values regarding the environment.

4.2. The grassroots perspective

F2 is a grassroots perspective that supports autonomous adaptation by highly valuing the environment and the need for meeting basic needs. It values a reactive, self-reliant attitude towards disaster risks. This factor is built by three representatives of PO, three NGO workers (two from environmental NGOs, and one from a social development NGO), and two government officers from the municipal and provincial level.

A major component of the grassroots perspective is a strong concern for the environment, which is evident in the high ranking of statement 3 stating that ‘Mother Nature’ should be protected for preventing devastating calamities. Along with this environmentalist stance, the grassroots perspective is characterized by a strong agreement regarding the idea that one cannot go against nature (S02). A PO representative (Q11) justifies a high score by claiming that “Nature cannot be hold” and will always have the last say. In the case of typhoon for instance,

respondents often refer to the strength of the meteorological event, as well as the random character of its path.

In the light of climate change perception, F2 loaders claim observing coastal erosion due to strong winds, heavy rain, or soil extraction (S06). However, none blame climate change or explicitly voice a relationship between those two phenomena. Meanwhile, the strong agreement regarding the statistically significantly statement 17 emphasizes a close association between climate change adaptation and DRRM activities, which suggests that F2 loaders have a lower awareness regarding the challenge of climate change. In any event, respondents loading highly on F2 differ from all other factors by strongly agreeing that climate change brings only negative benefits such as “disasters” or “calamities” (S12).

The grassroots perspective is also characterised by the highest ranking of the statement claiming that more urgent problems exist than climate change (S13). It is sustained by the idea that people will take measures against climate change only if they are badly affected (S14). For one PO representative (Q12), a “day-by-day” way of living along with a “wait and see” attitude makes common sense.

In terms of approach to adaptation and planning practices, the grassroots perspective is characterized by a stronger reliance upon technical and scientific knowledge for addressing climate risks. Regarding climate risk assessment, this perspective distinctively supports that hazard maps should be made by external experts, not by local people (S30). Respondents loading highly on F2 see the former as “the ones telling which area is dangerous” (Q11). Along with this stance, F2 does not value the importance of asking local people to recall past severe weather events as much as all other factors (S29). Meanwhile, F2 also stands out from all other factors by a self-reliant attitude regarding disaster response, particularly given the positive score attributed to statement 22. Based on their experience, F2 loaders comment that the community is faster than LGUs because it is the first one affected, and thus the first one to respond.

4.3. The developmental perspective

F3 represents a developmental perspective that supports planned adaptation, but advocates for a strong role of individuals and local community actors in planning practices. This factor is built upon the viewpoint of five government officers from the *barangay*, municipal, and national level, three NGO workers, and one PO representative. The developmental perspective is positively correlated with the institutional perspective ($p=0,798$), but differs by a stronger commitment for social development.

F3 comes into a developmental perspective with statement 15 that advocates for improved living conditions in order to face climate change impacts. A municipal officer (Q22) scored this statement positively, arguing that one may be more adaptive if basic needs are satisfied. Respondents from the NGO sector in turn further argue that improved quality of life would allow “co-opting more easily with the effects of disasters” (Q20), “mak[ing] relocation easier” (Q17) in case of disasters, increasing people participation to DRRM activities, and improving community resilience in general.

Besides, the developmental perspective strongly believes that projects from NGOs can be sustained (S21). One Municipal planning and development officer for instance explains that many NGO based projects are still running within his municipality today. In his view, reasons for such a success belong to the project design which should be prepared with both the community and the local government. Projects with “strong sustainability factors” (Q21) will be ensured to be institutionalized at both the Municipality and the Barangay level. While the developmental perspective values NGOs’ work, it also strongly values, along with the institutional perspective, the role of Barangays in responding to climate change impacts and improving adaptive capacity (S19).

Another major characteristic of F3 is an approach to adaptation valuing the role of individuals and local community actors. This is represented by the negative ranking of the distinguishing statement which claims that people will take measures against climate change only if they are badly affected (S14). One municipal officer (Q21) justifies his view by claiming that people’s awareness regarding DRRM and CCA has improved compared to 20 years ago. This belief in individuals’ capacity for mobilization is also highlighted within this perspective through the idea that local citizens do know about the challenge of climate change (S25). In this regard, it positively values the integration of local knowledge in climate risk assessment (S31). A NGO worker (Q20) for instance gave this statement a positive score by reporting that local communities can mark water levels on their house in order to monitor and make comparisons from one year to another.

Lastly, F3 is a pro-planning, but anti-hard measures approach to climate change adaptation. The developmental perspective strongly supports the formulation and implementation of plans for reducing climate risks (S26), but poorly values hard adaptation measures by distinctively supporting that building dikes and sea walls is not a long-term solution (S34).

4.4. The physical planning perspective

F4 is a physical planning perspective that supports planned adaptation by emphasizing the importance of spatial planning practices (including building hazard mitigating infrastructures and land use zoning). It is driven by a strong awareness of local disaster risk management issues and the need for urgent, technical responses to current climate change impacts. This factor is represented by two local government officers (one municipal planning and development officer and one *barangay* officer) involved in the implementation of disaster risk reduction and management plans, and one PO representative from an island Barangay experiencing increasing tide heights.

A first major component of F4 is to highly value spatial planning measures for addressing climate risks. F4 presents statistically significant rankings for several statements promoting land use zoning measures and hazard-mitigating infrastructures. Firstly, the statement claiming that land use measures like zoning will prevent from natural hazards received a distinguishing positive score (S32). As a zoning officer, one respondent from a municipal government (Q27) referred to the municipality’s land use plan and zoning ordinance, arguing that all plans should integrate disaster risk prone areas. In line with this pro-land use zoning perspective on climate change adaptation, F4 loaders consider that relocation is one of the best options to avoid floods (S38). Then, the physical planning perspective on adaptation is also determined by the ranking of

statements addressing the development of hazard-mitigating infrastructures (S35, S36, and S37). Respondents loading significantly on F4 justified their answers arguing that sea walls can help prevent floods, that better roads should be built, and that building well-designed sewerage systems will prevent the risk of flood.

A second major component of F4 is a moderate account for individuals and communities' role in climate change adaptation. F4 presents a low agreement on the statement advocating more participation from local communities in disaster preparedness activities (S23). This stance comes into sharp perspective by disagreeing about the idea that community responses to calamities are faster and more efficient than LGUs responses (S22). One municipal officer (Q27) explains his score telling that communities must be trained to be efficient. The physical planning perspective, however, is well grounded in local socio-economic and environmental realities. These distinct characteristics rely upon several significantly different claims: that devastating calamities did exist 30 year ago; that improving living conditions is essential in order to address climate risks; and that plans should be initiated at the *barangay* level but are useless if they are not coordinated with higher government levels (S05, S15, and S28).

5. Discussion

Actors' viewpoints on climate change adaptation and planning practices are held across four empirically determined social perspectives. These perspectives present a high shared meaning, which was illustrated by the positive and relatively high correlation between factors scores. This is an evidence of major commonalities between perspectives that reflect a common interest or culture-wide understanding among actors from the field of development planning regarding climate change adaptation in the Philippines. The four social perspectives hold a common agreement upon the idea that climate change is a reality impacting many different sectors that should be addressed pro-actively (see consensus statements 9, 11 and 24). Besides, development planning is an activity positively valued within each social perspective. In particular, participatory approaches with multiple actors are supported among all perspectives for implementing inclusive planning practices (S27 and S23). In this regard, results are consistent with the observation of Few et al. (2007) that discourses of inclusive governance advocating participation are widespread among actors involved in climate change adaptation.

Yet, results also suggest more complexity in implementing adaptation strategies than commonalities among perspectives first indicate. Along with Pelling's (2011) observation about the existence of multiple actors' viewpoints on how to adapt, the four social perspectives identified provide evidence that actors from the field of development planning in the Philippines do hold divergent viewpoints when it comes to frame climate change adaptation and prioritize planning activities. While addressing climate change and building inclusive planning practices is commonly valued as a desired *end*, differences between perspectives emerge when considering the *means* of implementing adaptation processes through planning practices. In particular, perspectives present major differences regarding how multiple actors should be involved in planning activities. This can best be exemplified by differences among the physical planning and grassroots perspectives.

Although the physical planning perspective acknowledges the importance of participatory approaches, it holds a critical attitude towards community's adaptive capacity by supporting the

idea that individual actors cannot address climate risks without being trained and prepared to be efficient. By contrast, the grassroots perspective does not consider governments as essential for enacting adaptation. In terms of disaster responses for instance, this perspective promotes adaptive strategies that build upon community's role and the "*Bayanihan* system" (i.e. a Filipino expression designing a spirit or attitude of communal unity to achieve a particular objective). Such a differing prioritization regarding the role of community and government actors in planning practices thus provide evidence that divergent adaptation strategies may emerge among actors from the field of development planning.

These findings contribute characterizing how development planning can guide adaptation thinking in at least two ways. First, results highlight that the four social perspectives identified among development actors in the Philippines support differently the two main forms of adaptation (planned and autonomous) commonly identified in the climate change literature (Agard et al., 2014; Hedger et al., 2011). The grassroots perspective supports autonomous adaptation and the physical planning perspective highly supports planned adaptation. Yet, the institutional perspective only advocates for planned adaptation to a lesser extent, and the development perspective supports both planned and autonomous adaptation strategies. In order to strengthen adaptive capacity, this suggests it is also essential to appraise development planning not only as a two-way process where planned and autonomous forms of adaptation may compete as divergent adaptation strategies, but also as a process driven by actors that combine those two approaches to adaptation in creative ways.

Second, each social perspective offers an essential starting point to foster the development of adaptation strategies involving multiple actors across scales. Although Resurreccion et al. (2008) pointed a mismatch between national and local level realities in the Philippines, results suggest shared viewpoints exist among actors from multiple levels of the planning hierarchy. The social perspectives identified both divide organisations and cut across boundaries between organisational structures: each of the four social perspectives identified comprises actors from both government agencies and civil society organisations at the national and local level. An actor's structural position thus should not be considered as a single predictor of any form of adaptation (neither planned nor autonomous). On the contrary, this suggests that development planning has the capacity to develop processes that incorporate *a priori* distant levels of individual and organisational actors.

Finally, while focusing on governments and civil society organisations among the formal planning system in the Philippines proved being useful for investigating how development planning can strengthen adaptive capacities, this research further highlights the need to expand the analysis on actors from the informal domain. These may include actors from informal settlements or the most vulnerable communities and households non-represented by formal civil society organisations. Understanding their viewpoints and see how much these may relate to the four perspectives extracted within this study would help better understand the extent to which the adaptation strategies valued by formal actors may be accepted and effectively implemented among these populations. In this regard, the continued use of Q-method is supported as a useful qualitative and quantitative research technique allowing the engagement of multiple types of actors in novel ways.

6. Conclusion

This paper aimed at capturing multiple social perspectives on climate change adaptation and planning practices across the organisational hierarchy of planning in the Philippines, and examined whether commonalities and differences among these perspectives may lead towards divergent or convergent adaptation strategies. Four empirically significant social perspectives were determined – institutional, grassroots, developmental, and physical planning – using Q-method, an intensive and quantitative technique. Major differences and commonalities between perspectives were highlighted, in addition to actors’ arguments used to justify claims. These social perspectives are characterized by several distinctive stances regarding climate change adaptation and planning practices in the Philippines.

First, the institutional perspective values the role of government institutions for mainstreaming climate change adaptation into local development planning. Second, the grassroots perspective gives more prominence to environmental protection and the need for meeting basic needs, along with a self-reliant attitude towards disaster risks. Third, the developmental perspective advocates for the role of individuals and local community actors in planning practices. Fourth, the physical planning perspective values the importance of spatial planning measures (including building hazard mitigating infrastructures and land use zoning) and emphasizes the need for urgent, technical responses to current climate change impacts.

Results contribute filling a knowledge gap in the literature on the need to develop approaches that can guide adaptation thinking in development planning. They first provide evidence that differentiated viewpoints on climate change and planning practices may lead to divergent adaptation strategies (e.g. through a differing prioritization regarding the role of community and government actors). Yet, the four social perspectives identified also suggest that shared adaptations may emerge both among actors from multiple organizational structures and across the organisational hierarchy of planning.

In terms of policy and practice, this highlights the need for developing approaches that facilitate the inclusion of these multiple perspectives. In particular, development planning should continue to focus on building learning processes that bring around the table multiple actors with diverse values and worldviews for developing a common understanding on how to strengthen adaptive capacities. This calls for directing attention to negotiations and the creation of spaces for the emergence of cross-scale relationships and shared power between actors. More than accounting for the multiplicity of viewpoints, development planning requires creating participatory venues for negotiation and sharing decision-making through collaborative actions. One example is creating participatory planning mechanisms that ensure the inclusion of actors from all levels of the planning hierarchy, rather than solely relying upon scientific and government actors for instance. When accounting for cross-scales relationships among actors and creating new spaces of shared meaning and action, development planning becomes a promising candidate for strengthening adaptive capacities and delivering more effective responses to climate change.

References

- Abdi, H. (2003). Factor rotations in factor analyses. In M. Lewis-Beck, A. Bryman, & T. Futing (Eds.), *Encyclopedia of social science research methods* (pp. 792-795). Thousand Oaks: Sage.
- Adger, W. N., Arnell, N. W., & Tompkins, E. L. (2005). Successful adaptation to climate change across scales. *Global Environmental Change*, 15(2), 77-86. doi:10.1016/j.gloenvcha.2004.12.005
- Agard, J., Schipper, E. L. F., Birkmann, J., Campos, M., Dubeux, C., Nojiri, Y., . . . Bilir, T. E. (2014). Annex II: Glossary. In V. R. Barros, C. B. Field, D. J. Dokken, M. D. Mastrandrea, K. J. Mach, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. MacCracken, P. R. Mastrandrea, & L. L. White (Eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1757-1776). Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
- AKP (2012) *Desktop study on assessment of capacity gaps and needs of South East Asia countries in addressing impacts, vulnerability and adaptation to climate variability and climate change*. Regional Climate Change Adaptation Knowledge Platform for Asia: Thailand.
- Bardsley, D. K., & Sweeney, S. M. (2010). Guiding climate change adaptation within vulnerable natural resource management systems. *Environmental Management*, 45(5), 1127-1141.
- Barry, J., & Proops, J. (1999). Seeking sustainability discourses with Q methodology. *Ecological Economics*, 28(3), 337-345.
- Birkmann, J., Welle, T., Krause, D., Wolfertz, J., Suarez, D. C., & Setiadi, N. (2011). World risk index: Concept and results. In ADW & UNU-IEHS (Eds.), *World risk report 2011* (pp. 13-43). Berlin: Alliance Development Works.
- Blanco, H., Alberti, M., Forsyth, A., Krizek, K. J., Rodríguez, D. A., Talen, E., & Ellis, C. (2009). Hot, congested, crowded and diverse: Emerging research agendas in planning. *Progress in Planning*, 71(4), 153-205. doi:10.1016/j.progress.2009.03.001
- Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven: Yale University Press.
- Bulkeley, H., & Betsill, M. (2005). Rethinking sustainable cities: Multilevel governance and the 'urban' politics of climate change. *Environmental politics*, 14(1), 42-63.
- Cañares, M. (2014) *Briefing: Assessing open governance data in Bohol*. STEP UP Consulting: Bohol. 1 p.
- Capili, E. B., Ibay, A. C. S., & Villarin, J. R. T. (2005, 19-23 September). *Climate change impacts and adaptation on Philippine coasts*. Paper presented at the Proceedings of the International Oceans 2005 Conference, Washington D.C, USA.
- Cash, D. W., & Moser, S. C. (2000). Linking global and local scales: designing dynamic assessment and management processes. *Global Environmental Change*, 10(2), 109-120.
- Corfee-Morlot, J., Cochran, I., Hallegatte, S., & Teasdale, P.-J. (2011). Multilevel risk governance and urban adaptation policy. *Climatic change*, 104(1), 169-197.
- Cutter, S., Osman-Elasha, B., Campbell, J., Cheong, S.-M., McCormick, S., Pulwarty, R., . . . Ziervogel, G. (2012). Managing the risks from climate extremes at the local level. In C. B. Field, V. Barros, T. F. Stocker, D. Qin, D. J. Dokken, K. L. Ebi, M. D. Mastrandrea, K. J. Mach, G.-K. Plattner, S. K. Allen, M. Tignor, & P. M. Midgley (Eds.), *A special report of working groups I and II of the Intergovernmental Panel on Climate Change (IPCC)* (pp. 291-338). Cambridge: Cambridge University Press.
- DILG (2008) *Rationalizing the Local Planning System: A Source Book*. Department of the Interior and Local Government: Bureau of Local Government Development: Quezon City, Philippines.

- Eden, S., Donaldson, A., & Walker, G. (2005). Structuring subjectivities? Using Q methodology in human geography. *Area*, 37(4), 413-422.
- Engle, N. L., & Lemos, M. C. (2010). Unpacking governance: building adaptive capacity to climate change of river basins in Brazil. *Global Environmental Change*, 20(1), 4-13.
- Few, R., Brown, K., & Tompkins, E. L. (2007). Public participation and climate change adaptation: Avoiding the illusion of inclusion. *Climate policy*, 7(1), 46-59.
- Friedmann, J. (1987). *Planning in the public domain: From knowledge to action*: Princeton University Press.
- Füssel, H.-M. (2007). Adaptation planning for climate change: concepts, assessment approaches, and key lessons. *Sustainability science*, 2(2), 265-275.
- Hall, P. (1982). *Urban and Regional Planning* (3rd ed.). London: George Allen & Unwin.
- Hedger, M., Moench, M., Dixit, A., Kaur, N., & Anderson, S. (2011) *Approaches to planning for climate change: Bridging concepts and practice for low carbon climate resilient development*. Institute of Development Studies: Brighton. 39 p.
- Huntjens, P., Lebel, L., Pahl-Wostl, C., Camkin, J., Schulze, R., & Kranz, N. (2012). Institutional design propositions for the governance of adaptation to climate change in the water sector. *Global Environmental Change*, 22(1), 67-81.
- IDS. (2010, 18-19 May). *Strengthening climate resilience: Philippines national consultation*. Paper presented at the Proceedings of the First National Consultation on Strengthening Climate Resilience in the Philippines, Quezon City, Philippines.
- Inderberg, T. H., Eriksen, S., O'Brien, K., & Sygna, L. (2014). *Climate change adaptation and development: Transforming paradigms and practices*. London: Routledge.
- Leck, H., & Simon, D. (2013). Fostering multiscale collaboration and co-operation for effective governance of climate change adaptation. *Urban Studies*, 50(6), 1221-1238.
- McKeown, B., & Thomas, D. (1988). *Q methodology*. Newbury Park (CA): Sage.
- Murdoch, J. (2006). *Post-structuralist Geography: a Guide to Relational Space*. London, UK: SAGE Publications.
- O'Brien, K. (2009). Do values subjectively define the limits to climate change adaptation? In W. N. Adger, I. Lorenzoni, & K. L. O'Brien (Eds.), *Adapting to climate change: Thresholds, values, governance* (pp. 164-180). Cambridge: Cambridge University Press.
- O'Brien, K., & Selboe, E. (2015). *The Adaptive Challenge of Climate Change*: Cambridge University Press.
- Pelling, M. (2011). *Adaptation to climate change: from resilience to transformation*. London: Routledge.
- Pini, B., Previte, J., & Haslam-McKenzie, F. (2007). Stakeholders, natural resource management and Australian rural local governments: A Q methodological study. *Local Government Studies*, 33(3), 427-449.
- Potter, R. B. (1985). *Urbanisation and planning in the third world: Spatial perceptions and public participation*. London: Routledge.
- Pugh, J., & Potter, R. B. (2003). *Participatory planning in the Caribbean-lessons from practice*: Ashgate Publishing Ltd.
- Resurreccion, B. P., Sajor, E. E., & Fajber, E. (2008) *Climate adaptation in Asia: Knowledge gaps and research issues in South East Asia*. ISET-International and ISET-Nepal: Kathmandu.
- Rincón, M. F. G., & Virtucio, F. K. (2008, June). *Climate change in the Philippines: A contribution to the country environmental analysis*. Paper presented at the Proceedings of the Country Environmental Analysis Consultative Workshops, Manila, Philippines.
- Robbins, P. (2005). Q methodology. *Encyclopedia of social measurement*, 3, 209-215.
- Robbins, P., & Krueger, R. (2000). Beyond bias? The promise and limits of Q method in human geography. *The Professional Geographer*, 52(4), 636-648.
- Shaw, A., Sheppard, S., Burch, S., Flanders, D., Wiek, A., Carmichael, J., . . . Cohen, S. (2009). Making local futures tangible—synthesizing, downscaling, and visualizing climate change scenarios for participatory capacity building. *Global Environmental Change*, 19(4), 447-463.
- Stephenson, W. (1935). Technique of factor analysis. *Nature*.

- 1
2
3 Stephenson, W. (1965). Perspectives in Psychology: Definition of opinion, attitude, and belief.
4 *Psychological Record*, 15(2), 281-288.
- 5 Van Aalst, M. K. (2006). The impacts of climate change on the risk of natural disasters.
6 *Disasters*, 30(1), 5-18.
- 7 Yohe, G. W., Lasco, R. D., Ahmad, Q. K., Arnell, N. W., Cohen, S. J., Hope, C., . . . Perez, R. T.
8 (2007). Perspectives on climate change and sustainability. In M. L. Parry, O. F. Canziani,
9 J. P. Palutikof, P. J. van der Linden, & C. E. Hanson (Eds.), *Climate change 2007:*
10 *Impacts, adaptation and vulnerability. Contribution of working group II to the fourth*
11 *assessment report of the Intergovernmental Panel on Climate Change (IPCC)* (pp. 811-
12 841). Cambridge, UK: Cambridge University Press.
- 13 Zabala, A. (2014). qmethod: A package to explore human perspectives using Q methodology.
14 *The R Journal*, 6(2), 1-11.
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1.: Respondent characteristics

Organisational and individual actor	n	Adaptation type		Location
		<i>National</i>	<i>Autonomous</i>	
Government agency	20			
National officer	2	X		Manila
Regional officer	2	X		Cebu city
Provincial officer	5	X		Bohol
Municipal officer	6	X		Bohol
Barangay officer	5	X	X	Bohol
Civil society organisation	17			
Social development NGO representative	5		X	Bohol
Environmental NGO representative	6		X	Bohol
People's Organization representative	6		X	Bohol
	37			

Table 2. Rotated factor loadings¹

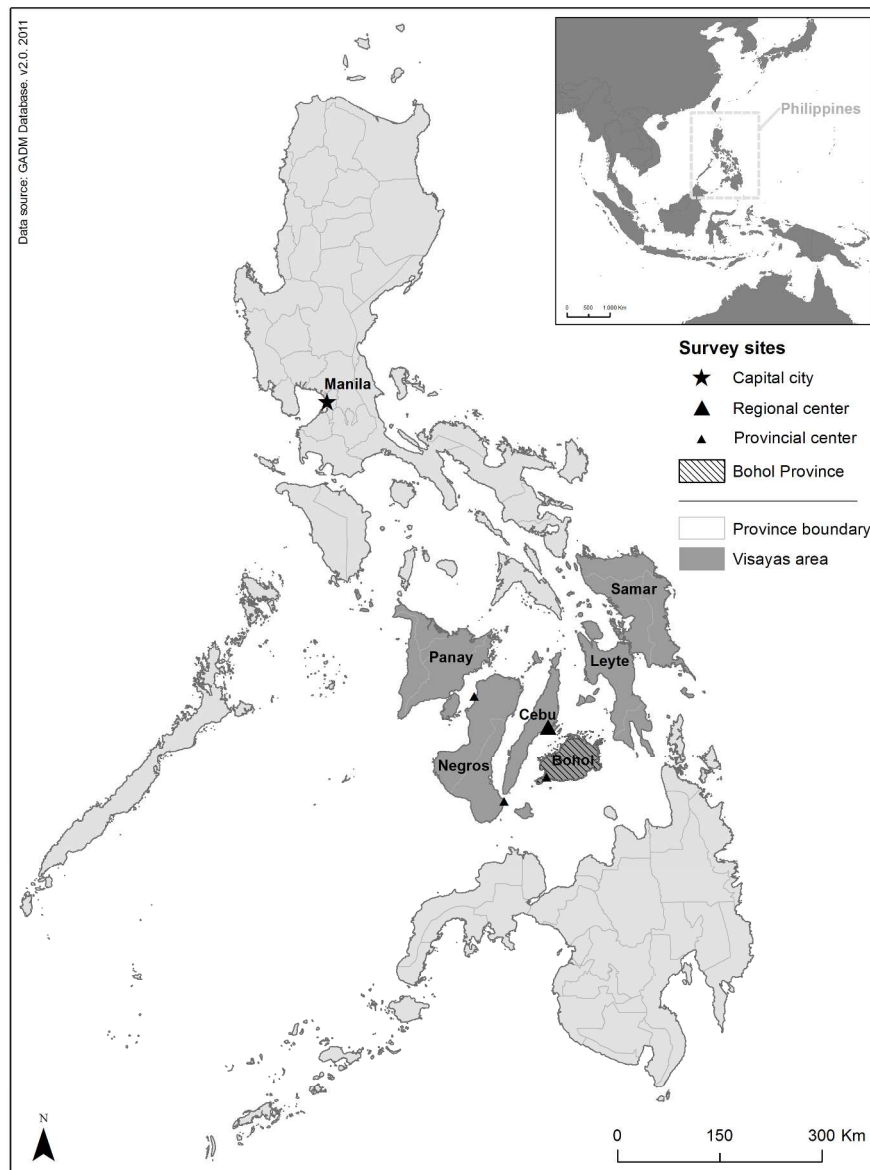
Q-sort	F1	F2	F3	F4
Q01: Provincial planning and development officer	0,876*	0,261	-0,122	-0,182
Q02: National climate change commission officer	0,844*	-0,128	-0,198	0,367
Q03: Provincial governance officer	0,723*	0,336	0,043	-0,125
Q04: Regional economic development officer	0,698*	-0,381	0,320	0,130
Q05: Regional planning and development officer	0,668*	0,184	-0,116	0,144
Q06: NGO representative	0,601*	0,209	0,155	-0,112
Q07: Provincial environment officer	0,545*	-0,131	0,090	0,089
Q08: Environmental NGO representative	0,447*	-0,292	0,287	0,426
Q09: People's Organization representative	-0,072	0,982*	-0,074	-0,071
Q10: Provincial civil society officer	-0,027	0,831*	-0,066	0,176
Q11: People's Organization representative	0,170	0,659*	0,064	0,071
Q12: People's Organization representative	0,291	0,618*	-0,132	0,042
Q13: Municipal Planning and Development Officer	-0,098	0,576*	0,116	0,055
Q14: NGO representative	0,428	0,559*	-0,014	0,115
Q15: Environmental NGO representative	0,566	0,484*	-0,071	-0,113
Q16: Environmental NGO representative	0,213	0,447*	0,503	-0,240
Q17: Environmental NGO representative	0,026	0,007	0,789*	0,121
Q18: Barangay Disaster Risk Reduction Management officer	-0,107	0,236	0,709*	0,053
Q19: Barangay Disaster Risk Reduction Management officer	0,275	-0,099	0,704*	-0,142
Q20: NGO representative	0,164	-0,36	0,703*	0,312
Q21: Municipal Planning and Development Officer	0,460	-0,113	0,668*	-0,207
Q22: Representative of Municipal Planning and Development Officers	0,298	0,158	0,483*	0,059
Q23: Environmental NGO representative	0,075	0,351	0,481*	-0,102
Q24: National disaster risk reduction management officer	0,355	-0,056	0,469*	-0,050
Q25: People's Organization representative	0,329	0,209	0,464*	-0,183
Q26: Municipal Disaster Risk Reduction Management officer	-0,122	0,044	-0,089	0,982*
Q27: Municipal Planning and Development Officer	0,137	0,095	0,074	0,629*
Q28: Barangay representative	0,115	0,223	0,111	0,616*

¹ Values grouped by defining sorts (*) then sorted in decreasing order

Table 3. Factor scores and rank statement scores for Q-sort statements

No	Statement	F1		F2		F3		F4	
		Z	Rank	Z	Rank	Z	Rank	Z	Rank
Climate change perception									
S01	Weather conditions are important in people's daily life	1,44	3	1,02	2	1,29	3	0,16 ^a	1
S02	Disasters are natural. We cannot go against nature	-0,60 ^d	-1	1,78 ^d	3	0,02	0	0,16	1
S03	Taking care of Mother Nature will prevent devastating calamities	1,12	2	1,76 ^d	3	0,77	1	0,16	1
S04	Start of the rainy and dry season has become unpredictable	1,09	2	0,28	1	1,14	2	0,10	-1
S05	Severe weather events and devastating calamities did not exist 30 years ago	-0,66 ^d	-1	-0,05 ^d	-1	-1,14	-2	-1,74	-2
S06	Our coastlines are being eroded because of climate change and sea level rise	0,20	0	-0,55 ^a	-1	0,55	1	0,13	0
S07	The idea of climate change is just a buzz word from national agencies and international institutions	-1,81	-3	-1,76	-3	-1,73	-3	0,77 ^a	1
S08	People observed changes in the seasons before scientists start talking about 'climate change'	0,76	1	-0,04	-1	0,56	1	0,13	0
S09	There is no clear evidence that the climate is changing in my area	-1,59 ^c	-3	-1,68 ^c	-3	-1,32 ^c	-3	-1,81 ^c	-3
S10	Climate change is a problem that only affects the poor	-2,31	-3	-1,06 ^a	-2	-1,95	-3	-1,84	-3
S11	Climate change leads to negative impacts in many different sectors such as water, agriculture, tourism, and health	1,02	2	1,58	3	1,03	2	1,00	2
S12	Climate change is not only a threat, it also brings positive benefits	0,81 ^d	1	-1,65 ^d	-2	-0,77 ^d	-1	0,00 ^d	-1
Adaptation approach									
S13	There are more urgent problems in my area than climate change	-0,33	-1	0,13	0	-0,64	-1	0,03	-1
S14	People will take measures against climate change only if they are directly badly affected	-0,38	-1	0,96 ^d	2	-1,01 ^d	-2	0,13	0
S15	Improving people's living conditions is the most important measure to take for facing climate change impacts	-0,54	-1	-0,77	-2	0,01 ^d	0	1,03 ^d	2
S16	Best responses to climate change are the ones answering a demand from local citizens	-0,17 ^c	0	-0,55 ^c	-1	-0,35 ^c	-1	-0,81 ^c	-2
S17	Adapting to climate change means only preparing for more natural disasters such as floods, storms, landslides, and typhoons	-1,51	-2	1,48 ^d	3	0,36 ^d	0	-0,94	-2
S18	Planting trees to reduce carbon dioxide (CO2) emissions is more important than learning how to face disasters	-0,20	-1	-0,71	-1	-0,90	-2	0,03	-1
S19	Barangays should conduct trainings to explain people what to do to avoid adverse effects of climate change	1,23	3	0,21 ^a	1	1,38	3	1,06	3
S20	NGOs play a better role than Government institutions to build the capacity of local communities because they work closer to the people	-1,07 ^a	-2	-0,02	-1	-0,27	0	0,03	-1
S21	Community-based projects from NGOs are difficult to sustain. Benefits for the community are often limited in time	0,45	1	0,88	1	-0,80 ^d	-1	0,06	-1
S22	Community response to calamities is faster and more efficient than LGU responses	-0,08	0	0,14	0	-0,77	-1	-0,84	-2
S23	People should participate to disaster preparedness activities, this is their duty as citizens	1,22	3	0,93	2	1,43	3	0,16 ^d	1
S24	The 'Bahala Na' attitude is a good way to face disasters	-1,85 ^c	-3	-1,88 ^c	-3	-2,22 ^c	-3	-1,78 ^c	-3
Planning practices									
S25	Local citizens don't know about the challenge of climate change, this is why national policies must be implemented at the local level	0,71	1	0,18	1	-0,43	-1	0,13	0
S26	Formulating and implementing plans reduces the risks from climate change	0,64	1	0,20	1	1,26 ^a	2	0,13	0
S27	LGUs should encourage more local community participation in the crafting of their plans	1,58	3	0,95	2	1,31	3	1,06	3
S28	A Barangay Disaster Risk Management plan is useless if it is not coordinated with plans from higher government units	-0,14	0	0,12	0	0,62	1	1,06	3
S29	Asking local people about past severe weather events they recall is essential for responding to potential future calamities	0,75	1	0,16 ^a	0	0,82	2	1,00	2
S30	Maps of hazardous areas should be made by local people, not by external consultants or experts who don't know the area	-0,26	-1	-2,18 ^d	-3	0,43	0	0,16	1
S31	Local communities can identify flood zones with great accuracy	0,02	0	0,16	0	0,66 ^a	1	0,03	-1
S32	Land use measure like zoning will prevent from natural hazards	0,06	0	0,11	0	0,01	0	1,03 ^a	2
S33	Planting mangroves is the best natural defence against storms	0,90	2	0,92	1	0,32 ^d	0	1,90 ^d	3
S34	Forests should be preserved and more trees should be planted to avoid landslides	1,04	2	1,02	2	0,77	1	0,16	1
S35	Building dikes and sea walls to avoid floods is not a long-term solution	0,32	0	0,06	0	0,81 ^d	1	-1,68 ^d	-2
S36	People would be less affected by heavy rains if we had appropriate drainage and sewerage systems	0,38	0	0,06	0	0,47	0	1,10	3
S37	Our road infrastructures (roads, bridges) are strong enough to face climate change impacts	-0,70	-2	-0,79	-2	-1,15	-2	-2,65 ^a	-3
S38	The best option to avoid flooding is relocating residents	-1,07	-2	0,00 ^d	0	-0,96	-2	0,97 ^d	1
S39	Relocating residents from risk prone coastal areas to upland areas is not viable because they will lose their livelihood	-1,15	-2	-0,80	-2	-0,72	-1	0,13 ^a	0
S40	People build houses in risk-prone areas because laws and building codes are not strictly enforced	0,69	1	-0,58 ^d	-1	1,09	2	0,13	0

a = distinguishing statement of factor i only; d= distinguishing statement of one factor or more; c = consensus statement
Note: Differences between pairs have a minimum significance at the 0,05 level. Statement loadings with differences between all pairs significant at the 0,01 level are labelled in bold.



215x279mm (300 x 300 DPI)